

# **EXHIBIT 61**

Document title:	GOAT uses machine learning, computer vision to verify your top dollar sneakers are authentic   ZDNET
Capture URL:	<a href="https://www.zdnet.com/article/goat-uses-machine-learning-computer-vision-to-veriry-your-top-dollar-sneakers-are-authentic/">https://www.zdnet.com/article/goat-uses-machine-learning-computer-vision-to-veriry-your-top-dollar-sneakers-are-authentic/</a>
Page loaded at (UTC):	Fri, 02 Aug 2024 21:58:41 GMT
Capture timestamp (UTC):	Fri, 02 Aug 2024 22:00:03 GMT
Capture tool:	10.48.1
Collection server IP:	54.145.42.72
Browser engine:	Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/124.0.0.0 Safari/537.36
Operating system:	Linux (Node 20.11.1)
PDF length:	7
Capture ID:	jR2Z127EKVu34fQaCZ4j3H
User:	dcchekhov



tomorrow  
belongs to those who embrace it  
today



trending

tech

innovation

business

security

advice

buying guides

/ innovation

Home / Innovation / Cloud

# GOAT uses machine learning, computer vision to verify your top dollar sneakers are authentic

GOAT CTO Andy Shin walks us through managing a team, KPIs, cloud computing and how the company goes about verifying those Nikes are real.



Written by **Larry Dignan**, Contributor

Aug. 19, 2018 at 3:00 p.m. PT

[D](#) [in](#) [v](#) [f](#) [t](#)

## ZDNET INNOVATION INDEX

rank trend

1 Synchron allows users to control Apple Vision Pro...

2 OpenAI releases Voice Mode for ChatGPT Plus

3 Apple Intelligence arrives in iOS 18.1 developer beta

4 Synthesia creates your AI clone in 5 minutes

[view trend report](#) →

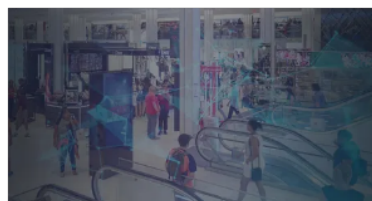
### How GOAT uses machine learning, cloud to get...



It takes a lot of machine learning and computer vision to ensure that a pair of high-end sneakers is authentic.

Just ask GOAT. GOAT is the largest sneaker marketplace and specializes in selling authentic goods. Specifically, GOAT provides buyers and sellers of sneakers an authenticity guarantee with a "ship to verify" model

### / special report



**Data, AI, IoT: The Future of Retail (free PDF)**

This ebook looks at the rise of e-

CNET

NAVIGATING  
A WORLD OF  
ACCELERATING  
CHANGE

### / related



**How Roomba's \$1,000 robot vacuum handled my house of children and pets**



**The 50+ best Prime Day robot vacuum deals still available**



**The best robot mops you can buy: Expert tested**

specializes in selling authentic goods. Specifically, GOAT

provides buyers and sellers of sneakers an authenticity guarantee with a "ship to verify" model.

GOAT, which has both e-commerce and physical retail locations, has 400 employees and 60 of them are engineers with 7 data scientists. We caught up with GOAT CTO Andy Shin to talk about machine learning, cloud computing and how to manage a team to focus on hitting key performance indicators. Here are some of the key takeaways.

**The authenticity issue.** Shin said GOAT, which employs 400 people, specializes in the "ship to verify model." Shin said:

**Nike is the world's most counterfeited sneaker. If you go online, there's a coin flip's chance that the shoes you're looking at is fake. And what our service provides is trust and authenticity. Sellers list sneakers for sale. Buyers find that sneaker at the right price and they purchase it.**

**And the experience that the buyer has is just like any other e-commerce website. They have no idea who's selling that sneaker to them. But we're in the middle. And what we provide is safety. And when that shoe is purchased, the seller ships it to us to verify. And we verify that product the same day using our sophisticated machine learning and computer vision, and our industry knowledge. And release the funds to the seller. And then we ship that product to the buyer to purchase.**

[What is deep learning? Everything you need to know](#) | [What is machine learning? Everything you need to know](#) | [What is cloud computing? Everything you need to know about the cloud, explained](#)

**Using computer vision and data to verify authenticity.** Shin said GOAT uses computer vision and a bevy of Amazon Web Services tools to verify authenticity. Shin explained:

**We use a lot of different heuristics and data points to verify whether the shoe is authentic or not. We see the most sneakers in the world. And we are the leader in data collection around sneakers. So every shoe that comes in, we're collecting all the data points for it. So we actually, we know what fakes look like. And we know what real shoes look like. Every single sneaker has multiple data points that we focus on.**

In a nutshell, GOAT is taking in physical attributes of shoes and replicate them digitally. Things like the suppleness of the sole, hardness of certain

**Data, AI, IoT: The Future of Retail (free PDF)**

This ebook looks at the rise of e-commerce and the digital transformation...

[Read now →](#)

**The best robot mops you can buy: Expert tested**



actually, we know what fakes look like. And we know what real shoes look like. Every single sneaker has multiple data points that we focus on.

In a nutshell, GOAT is taking in physical attributes of shoes and replicate them digitally. Things like the suppleness of the sole, hardness of certain rubbers and seams can tip off fakes.



**Building vs. buying machine learning and algorithms.** Shin said GOAT's machine learning and algorithms are proprietary. AWS is primarily used for compute infrastructure to run those algorithms. "We also leverage machine learning in our business. So we control the whole process from the moment that a buyer wants a product, to the moment they receive it. We control the whole supply chain," said Shin. Machine learning is used throughout the process to optimize warehouse management so GOAT knows the most efficient way to distribute shoes.

[Data, AI, IoT: The Future of Retail | The Future of Retail: 2018 and beyond | Survey: Most consumers use at least one form of tech to make shopping easier and more enjoyable](#)

**What the cloud brings?** Shin said what AWS and the cloud has enabled GOAT to do is focus on the machine learning behind distribution, authenticity and customer experience. GOAT would have had to build its own data centers and computing infrastructure and invest in the staff to run it. "What cloud computing really allows us to do is focus on building value," said Shin.

**Physical retailing and machine learning.** GOAT has physical retail stores called Flight Club and machine learning also plays a role in the experience. Shin said retailers need to innovate with experiences that can't be replicated online. GOAT uses machine learning to figure out how to merchandise sneakers. Using sensors, GOAT can track what

Physical retailing and machine learning. GOAT has physical retail stores called Flight Club and machine learning also plays a role in the experience. Shin said retailers need to innovate with experiences that can't be replicated online. GOAT uses machine learning to figure out how to merchandise sneakers. Using sensors, GOAT can track what sneakers are being picked up, dwell time and how a consumer works through a buying decision. Shin explained:

**NAVIGATING A WORLD OF  
ACCELERATING CHANGE**



**CNET**

Flight Club is much like a Foot Locker, in that there's a wall of shoes. Except we have 5,000 shoes in a retail store in New York City or Los Angeles. That's a lot of stuff to merchandise, right? So how do we know what to put at eye-level? We leverage machine learning. And we know for example how long someone's picked up the shoe. We know how long what they've done with it, and how long. And when they put it down. We also know which products have been requested. Whether or not we have the size for it. How long it took for that customer to get that product and try it on. So we leverage all these data points in order to create a great experience for our customers.

That data is collected and utilized for a weekly merchandising refresh.

**The Future of Retail: 2018 and beyond**



**Managing a team.** A year ago, GOAT had 20 engineers. Today, the company has 60. AWS has enabled GOAT to focus on its core KPIs since it doesn't have to do infrastructure. Now that the engineering team has tripled in size, Shin has retooled the structure via "pods." Shin said:

These pods are essentially KPI driven. They are key performance indicator driven pods that focus on certain aspects of our business. I'll give you an example. So our customers have high expectations for when they get a product. And so we have a pod focused on time of delivery. How do we get people product faster, and close the gap between when they purchase and when they actually receive the product?



indicator driven pods that focus on certain aspects of our business. I'll give you an example. So our customers have high expectations for when they get a product. And so we have a pod focused on time of delivery. How do we get people product faster, and close the gap between when they purchase and when they actually receive the product?

So that's a KPI driven pod that focuses on delivery. And what we really like to do is provide autonomy for these teams. We give them a KPI, and it's really up to these teams to figure out how they're going to reach this milestone, or to reach this metric. And what AWS has allowed us to do is to move to micro-services away from our monolithic application.

Shin added that the pods need to stay small and nimble. GOAT has 10 KPI-focused pods with 6 engineers each. These pods will evolve over time to focus on both the buy and sell side of a transaction.

#### ZDNET'S MONDAY MORNING OPENER

*The Monday Morning Opener is our opening salvo for the week in tech. Since we run a global site, this editorial publishes on Monday at 8:00am AEST in Sydney, Australia, which is 6:00pm Eastern Time on Sunday in the US. It is written by a member of ZDNet's global editorial board, which is comprised of our lead editors across Asia, Australia, Europe, and the US.*

#### Previously on Monday Morning Opener:


- [Windows 10 upgrades: Swapping the big bang for the long grumble?](#)
- [Report from an almost cashless society](#)
- [The 4 hottest tech trends that are transforming the world in 2018](#)
- [How Fortnite approaches analytics, cloud to analyze petabytes of game data](#)
- [Blockchain and bluster: Why politicians always get tech wrong](#)
- [Firefox and the 4-year battle to get Google to treat it as a first-class citizen](#)
- [The future of retail: 4 trends transforming how we shop](#)
- [Cloud wars 2018: 6 things we learned in the first half](#)
- [London's tech startups are booming, but their biggest challenge is just around the corner](#)
- [Blockchain: The 2 most important things to understand](#)

#### More retail:

- [Free PDF download: Data, AI, IoT: The future of retail](#)
- [Is Amazon Go's cashier-less shopping the future of retail?](#)
- [10 technologies leading digital transformation in retail](#)
- [10 companies leading digital transformation in retail](#)
- [10 vendors enabling digital transformation in retail](#)
- [How EB Games future-proofed its business model by going omnichannel early](#)

- [10 technologies leading digital transformation in retail](#)
- [10 companies leading digital transformation in retail](#)
- [10 vendors enabling digital transformation in retail](#)
- [How EB Games future-proofed its business model by going omnichannel early](#)

---

 Editorial standards

show comments ↓

